Delaware Department of Transportation Comments on 23 CFR 650, FHWA Docket No. FHWA-2001-8954, RIN 2125-AE86

Application Of Standards

The current FHWA regulation requires that the American Association of State Highway Transportation Officials (AASHTO) definition of a bridge be used when determining which structures are to be inspected and reported. Should the FHWA develop its own definition of a bridge for the purpose of inspection and reporting?

Answer: FHWA should maintain the use of the AASHTO definition of a bridge.

Should the FHWA definition change the way the bridge length is determined or what the minimum bridge length should be for reporting purposes

Answer: FHWA should maintain the 20 foot requirement for bridge length.

Current AASHTO policy measures bridges from undercopings of the abutments or spring lines of arches, or between extreme ends of openings for multiple boxes. The span opening then must be greater than 20 feet for reporting. What impact will the possible inclusion of more bridges be (1) on public authorities complying with this as an NBIS requirement, (2) or on the FHWA which maintains the inventory, (3) or on the HBRRP funds?

Answer: The impact of changing the length would be the inclusion of more bridges which may affect the funding apportionment percentage which each state receives. The authorities will also need additional funding to inspect the additional bridges and staff to maintain the larger databases.

The impact on FHWA of changing the length would be to re-apportion the funds and may require additional funds for which each state receives. The FHWA will also need to provide additional funding for the inspection of the additional bridges and staff to maintain the larger databases.

The affect on HBRRP funds may be the need for more funds and reapportionment.

Inspection Procedures

The current FHWA regulation includes the following:

- *The AASHTO ''Manual for Maintenance Inspection of Bridges'' [1] will be used for determining load ratings for each bridge;*
- *If the States' maximum legal load exceeds the load permitted under the operating rating then the bridge must be posted;*
- *A listing of bridges with fracture critical members along with information on location, description and inspection frequency must be maintained;*
- *Underwater members must be identified and special inspection performed no longer than every 5 years; and*
- *Bridges with other unique features*

must be identified and special safety inspections performed.

The results of underwater inspection of bridge piers since 1978 reveal that both construction materials used and the environment where the bridge is located impact inspection frequency. Also, the results of underwater inspections of bridge pier piling in concrete lined irrigation channels suggest that little, if any, deterioration occurs in the 5 years between inspections. Bridge engineers have commented that it may be more economical to increase the time between inspections, while not impacting safety. Based on comments from bridge engineers, the FHWA is considering changing the 5 year underwater inspection intervals and developing intervals which are tied to pile or foundation materials as well as the environment where the bridge is located. What impact will changing the underwater inspection intervals have on public authorities complying with this as an NBIS requirement?

Answer: Underwater inspection intervals should be maintained. A longer interval will allow for some authorities to comply but we find no hardship with the current interval. If longer intervals are permitted, the intervals should be tied to the condition of the substructure or scour evaluation.

Scour, the leading cause of bridge failure in the United States, is not addressed directly in the current NBIS regulations, but is covered in a FHWA technical advisory.[2] The FHWA is considering providing guidance within the regulations to address this. Also, the FHWA is seeking comment on whether it should provide guidance for what public authorities should do after major storm events. These storm events can, in some cases, severely undermine bridge piers that may have lost bearing capacity because of localized scour. The FHWA is considering inclusion of the FHWA Technical Advisory T 5140.23 within the NBIS regulations. What, if any, would be the impact on public authorities complying with evaluation of scour at bridges criteria within the NBIS regulation?

Answer: Post storm event inspections will require more inspection forces and possibly more funding. Scour language in the coding guide for substructure should be modified to consider if the scour will cause an adverse affect on the structure.

Frequency Of Inspections

The current FHWA regulation requires that bridges be inspected every 2 years. The maximum interval can be increased to 4 years with FHWA

approval after meeting certain conditions. Should the 4-year interval be increased so that more bridges would be eligible for the extended inspection cycle? What would be a reasonable interval? What impact would this have on the safety of bridges?

Answer: The 4 year interval could be extended to include major rehabilitations, for new structures or those which pose little danger in the event of a failure, such as culverts. Safety would not be an issue if the inspection interval was tied to the condition ratings.

Qualification Of Personnel

The current FHWA regulation requires that the individual in charge of the inspection and reporting be a registered professional engineer (PE); or be qualified for registration as a PE; or have a minimum of 10 years experience in bridge inspection in a responsible capacity and have completed certain training requirements. The individual in charge of the inspection team shall either meet the above qualifications or have a minimum of 5 years experience in bridge inspection assignments in a responsible capacity and have completed certain training requirements. Should the individual in charge of the inspection and reporting who is a PE be required to have the same training as bridge inspectors and have additional experience in bridge inspection?

Answer: The individual in charge of the team should have training and experience prior to taking charge.

In the current regulations, the registered professional engineer is not required to have specific bridge inspection training. Also, the discipline of the registered professional engineer is not specified. The FHWA is considering requiring that bridge inspections be performed by either a civil or structural engineer who is also a licensed professional engineer. Currently, the regulation permits professional engineers within other engineering disciplines to inspect highway bridges. Experience shows that only those engineers specifically trained to provide bridge inspection services are best equipped to conduct bridge inspections. Should the NBIS regulation be more specific as to the discipline of the professional engineer responsible for these bridge inspections and what impact would this change have on public authorities complying with this?

Answer: NBIS regulation should require the individual performing bridge inspections to be of Civil or structural engineering discipline regarding registration. Some local authorities may be required to expend more funds to hire “qualified” engineers.

Bridge engineers have indicated that inspection programs need to include an engineer in training (EIT) component. Bridge engineers feel that a graduate EIT engineer should qualify as a field team leader with appropriate bridge inspector's training and a minimum of 2 years bridge design, inspection or construction experience.
According to the NBIS, a bridge inspector must have a minimum of 10 years experience in bridge inspection assignments in a responsible capacity. Bridge engineers would like clarification of the phrase ''in a responsible capacity.''
Section 151 of title 23, U.S. Code, indicates that a training program for bridge inspectors shall be revised from time to time to take into account new and improved techniques. Bridge engineers have indicated that qualifications for inspectors should be modified to provide more training or experience in proportion to the complexity of the structure being inspected. The FHWA is considering requiring certification training in proportion to the complexity of the bridge structure being inspected, and making this a part of a requirement for inspectors under the national bridge inspection program. What impact would this change have on public authorities complying with this as an NBIS requirement?

Answer: The impact will be additional training for certification for inspectors. Would recommend national certification program which would require a three year renewal for team leaders and assistant inspectors. Would also recommend certification and training for inspection of special or unusual structures. This would require additional funding for the training and the specialized personnel.

Bridge engineers have indicated that the NBIS does not adequately address qualification requirements for those performing underwater inspections. Should those performing underwater inspections be qualified licensed professional engineers? Current regulations do not stipulate that the inspector in the water must also be an engineer. What impact would these proposed changes have on public authorities complying with this?

Answer: Underwater inspections should be performed by an underwater bridge inspection trained engineer, not necessarily a professional engineer. The team leader should be required to have the same qualifications and have a PE. The PE should be able to perform the same work as the diver/inspector by being able to go into the water to check condition. This will increase the costs of underwater inspections.

Inspection report

Bridge inspectors have indicated that

those in management have made changes to their reports without having been in the field to view, first hand, the conditions of a particular bridge. The FHWA does not support this practice and believes any change to an inspection report should be made by the inspector who was out in the field. This procedure should be clearly covered in the NBIS. What if any would the impact be on public authorities complying with only allowing the inspector who was out in the field to change the inspection report as an NBIS requirement?

Answer: A requirement should be created requiring Inspection reports to be signed by the team leader. The person who signs the report or the person in charge of reporting should be the only ones to change the report. Changes by the person in charge of reporting should only be made after consultation with the team leader or a site visit is made to verify the condition in the field. A change of this nature would require an additional signature by the changer. No impact noted. It may place more responsibility on the team leader.

Inventory

The current FHWA regulation requires each State to maintain an inventory of all bridges in its State and submit the inventory to the FHWA annually. The data to be collected is outlined in the ''Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges.'' [3] Requirements for entering new or updated data into the State's inventory or placing load restriction signs is set to 90 days for bridges under the States jurisdiction and 180 days for all other bridges.

The FHWA believes that the procedures for bridge inventory are adequately written and require no modification. Should the reporting requirements for the NBIS be changed and what, if any, would the impact be on public authorities complying with this?

Answer: FHWA should only be concerned with annual updates. The 90/180 day requirement should be dropped since it is unenforceable because FHWA only receives database updates once a year.

Additional General Questions

1. Does the current regulation at 23 CFR part 650, subpart C, correctly address the requirements of 23 U.S.C. 151, national bridge inspection program?

Answer: The current CFR does not address qualifications very well. Although the CFR outlines qualification, the regulations are ambiguous and should be refined. The Current CFR does not address notations of actions taken as a result of findings from the inspections, i.e. maintenance records. The current CFR does not establish a national certification for bridge inspectors. The current CFR does not specifically outline the method of inspection.

2. What improvements would you recommend to the bridge inspection

procedures?

Answer: Actions or revisions based on answers to the many questions in this RIN will improve the standards. National certification for bridge inspectors and underwater bridge inspectors will assure proper evaluations. In addition, re-certifications should be required to assure that inspectors have a current knowledge of the practices and reduce old habits.

3. What specific procedures would you recommend to enhance the NBIS regulations?

Answer: Besides the above, no specific procedures are recommended. I would recommend that FHWA try to enhance the technology and importance of bridge inspections which would entice engineers, registered or not to enter the field. Credibility of the effort and duties must be emphasized.